SPECIFICATION

TITLE

"FLEXIBLE RESILIENT CLAMP DEVICE AND A CONTAINER COMPRISING THE FLEXIBLE RESILIENT CLAMP DEVICE"

BACKGROUND OF THE INVENTION

The present invention refers to a flexible resilient clamp device, which is adapted to be detachably fixable in, and/or to a container and also to a container system, in particular a storage container system, which comprises the flexible resilient clamp device and the container.

Resilient clips or clamps, for example made from plastic or metal, are commonly used to engage or attach loose or lightweight products like sheets or bags to a receptacle or support unit. Also, container lids are frequently affixed to a receptacle with the aid of a flexible clip element, which engages into respective fixtures. Although a multitude of different clip applications is known, the potential, which resides in clip or clamp fastening has not yet been exploited to its full extent.

Containers or boxes for the storage or take up of for example CDs or DVDs, are in widespread use. Data carriers of every type are not only frequently used in households, but in particular also at the work place. As the number of such data carriers, irrespective of whether in private or professional use, is steadily growing, it becomes more and more difficult to keep up with the amount of individual items to be stored, as well as to keep record of all these items. For these purposes, a variety of different container types, which may vary in form, shape and dimension are available.

According to U.S. Patent No. 5,372,263, data carriers, like CD-boxes, can be located and relocated in a display rack which has a substantially rectangular shape in elevation view for positioning and locking, unlocking, and taking out a flat data box carrier. These carriers are located on a plurality of intermediate longitudinal locking units extending from a surface of the modular display rack. The carrier can be removed only by lifting and tilting it against a protrusion, which extends from a rear surface of the module display rack and which acts as a fulcrum causing an upper portion of the carrier to move into the space thereby allowing the carrier to be removed from the display rack. The display rack and also the flat data box carriers are aligned in a vertical direction. Although the data carriers can be clearly arranged with such vertical display rack, only a very limited number of data box carriers can be stored.

From U.S. Patent No. 5,564,801 a combination system of rectangular combination plates and linear connecting strips for holding boxed compact discs can be derived. The compact disc box carriers are placed in insertion channels a plurality of which are aligned on a profiled plate. The insertion channels are formed by parallel grips into which the CD-boxes can be placed in a vertical manner. As the individual grips are usually very thin in order to not waste any material and also to provide for a maximum of storage capacity, there is little intermediate space left to remove the data box carriers rather conveniently. Also, compared to the length of the data box carrier, the height of the grips of the insertion channels or spacer slots is rather small in order to facilitate insertion and removal of the data box carrier. However, the lesser the height of the grips the more the data box carriers are prone to fall over.

U.S. Patent No. 5,947,301 discloses a structure for filing standard boxes for compact disks by hooks fixable in openings for hanging standard boxes in a hanging file. The hooks are usually shaped onto two sides of a U-shaped member, which engages around the boxes and has an elastically flexible connecting web.

To properly store data box carriers with the above mentioned structures, the material and dimensions chosen have to be well adjusted as otherwise the storage and/or filing of these boxes is hampered or impossible. For example, only those plastic materials should be suited to form insertion channels for compact disc boxes, which are insensitive to temperature changes with respect to thermal expansion. Also, if those racks or profiled plates are, for example, extruded or injection molded, their manufacture has to meet high standards to reliably furnish standardized products with each having identical dimensions.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a system for storing or holding individual items, in particular data box carriers, which overcomes the drawbacks of the state of the art and with which these items can easily be inserted, removed and stored and which do not tend to fall over irrespective of the number of data box carriers already placed inside a container, simultaneously allowing for a clear arrangement of these data box carriers.

In accordance with at least one form of the invention, a flexible resilient clamp device is provided which is detachably fixable to a container. Two substantially opposite clamp halves are interconnected at a top part, are movable

toward each other, and exert an outward pressure when compressed. At a portion of a bottom part in a region of one end of at least one of the clamp halves a fixation structure is provided for holding the clamp device in a fixed position by engaging the container.

BRIEF DESCRIPTION OF THE DRAWINGS

Figs. 1a to 1e are perspective views of different embodiments of a clamp device;

Fig. 2 is a perspective view of another embodiment of a clamp device;

Fig. 3 is a perspective view of a container;

Fig. 4 is a perspective view of another embodiment of a container;

Figs. 5a, b, c are schematic views of a clamp shown from two different sides;

Fig. 6 is a schematic sectional view of a container system;

Fig. 7 is a schematic sectional side view of a clamp and a container;

Fig. 8 is a top view of the clamp and the container according to Fig. 7;

Fig. 9 is a schematic sectional side view of a clamp and a container;

Fig. 10 is a top view of the clamp and the container according to Fig. 9;

Fig. 11 is a schematic sectional side view of a clamp and a container;

Figs. 12a, b, c are schematic views of another embodiment of a clamp shown from two sides;

Fig. 13 is a longitudinal side view of a container adapted to fix clamps according to Fig. 12;

Fig. 14 s a schematic side view of a clamp;

Fig. 15 is schematic side view of a clamp according to Fig. 14 after having been turned about 90°;

Fig. 16 is a longitudinal side view of a section of a container adapted to fix a clamp according to Figs. 14 and 15; and

Fig. 17 is a top view of a container according to Fig. 16 and a clamp according to Figs. 14 and 15 fixed in said container.

DESCRIPTION OF THE PREFERRED EMBODIMENT

For the purposes of promoting an understanding of the principles of the invention, reference will now be made to the preferred embodiment illustrated in the drawings and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended, such alterations and further modifications in the illustrated structure, and/or method, and such further applications of the principles of the invention as illustrated therein being contemplated as would normally occur now or in the future to one skilled in the art to which the invention relates.

A flexible resilient clamp device which is adapted to be detachably fixable in and/or to a container comprises at least two essentially opposite clamp halves which are in particular at least interconnected at the top part of the clamp device. They are adapted to be moved, an one part, towards each other, and exert an outward pressure when compressed. The clamp further comprises at least in one segment, in particular in the bottom part towards one end. There is also at least one clamp half with a fixation structure adapted to hold the clamp in a fixed position, particularly in a vertical and/or horizontal position, in and/or on a container, in particular by engaging. In one

embodiment only one clamp half is provided with a fixation structure as described herein whereas the opposite clamp half exhibits a segment which is adapted to be pressed against the side wall of, for example, a container. The part of the segment which comes in contact with a wall when clamped can preferably have a non-chip surface.

A fixation structure is selected from the group comprising a notch, indentation, protrusion, groove, tongue- or tooth-like element, a hole, a groove-like depression, and a pin, and adapted to be fixed to and/or on a container.

A width of the clamp device is smaller than the distance between the opposite clamp halves adjacent to their fixation structure.

In a preferred modification, the opposite clamp halves are part of an arc-like structure, said opposite clamp halves adjacent to the bottom part of the clamp device being further apart than intermediate and/or top parts of the clamp device.

Provisions may be made that the flexible resilient clamp has opposite side faces which confine the width of the clamp device.

A space between opposite clamp halves is partially or completely filled with an elastic and/or elastomeric and/or foam material and/or with at least one spring. Thus, if for example, the material or structure of the outer walls of the clamp device do not suffice to furnish a clamp which is resilient and/or flexible. The space between the clamp halves can be filled with an appropriate material.

A flexible resilient clamp device is provided wherein at least one side face of at least one clamp half comprises, at least partially, a rim or a wall

element, in particular adjacent to the upper wall of the clamp. By using in addition to the wall of the clamp halves further structural elements such as a rim, in particular along the one or both entire side edges of the clamp, the clamp device can be stiffened.

In one preferred embodiment at least one portion of the rim and/or wall element and/or surface of at least one clamp half comprises at least one hole and/or depression adapted to take up pencils, scissors and/or glue sticks or the like. Especially when the clamp is used in different orientations, for example in a CD-box container, a hole in a rim of the clamp device can be used as a receptacle used temporarily for a pen.

Provisions may be made that the flexible resilient clamp device essentially comprises a metal, plastic and/or wooden material. Most preferred, the clamp devices are made from plastic, especially thermoplastic polymers or impact modified thermoplastic polymers or blends thereof. Clamp devices out of plastic can be manufactured, for example, by injection molding or extrusion, preferably in a single step.

In another preferred embodiment, the flexible resilient clamp device is characterized in that at least one clamp half is extendible. With extendible clamp devices the upper part can be used already as a handle, when the clamp device is fixated in a container. Also, in particular when the clamp halves form an arc-like structure extendible clamp halves allow for being used in storage boxes and containers of various sizes. The more extended the clamp halves are the further apart the fixation structure on both clamp halves will be and the broader the containers can be.

Additionally, the flexible resilient clamp device may preferably be adapted in that the upper part of the clamp device, in particular adjacent to where the clamp halves are interconnected, comprises at least one handle or is formed as a handle. Provision can be made to design the upper part of the clamp device so that it can be used best for transport.

Further, a flexible resilient clamp device is preferred wherein at least the upper part of the clamp comprises at least one trench or slot adapted to take up flat items. Usually, a plurality of data box carries are stored in one container. With a trench or slot in the upper part of the clamp device, for example, the CD-box of the data carriers presently in use can be placed in this slot, thereby helping to keep an overview. Also, the trench can serve as a means to insert a wall element which corresponds in shape to the clamp device thereby yielding, for example, together with the clamp an inner container wall, especially when the trench or slot is located across opposite clamp halves in the bottom part of the clamp. The trench can, as an alternative, also be placed across the top part of the clamp so that the clamp halves lie on opposite sides of the trench walls.

In one preferred embodiment, a flexible resilient clamp device is characterized in that the fixation structure on at least one clamp half, in particular in the bottom part, comprises at least two, three, four or more adjacent, in particular identical or similar, protrusions or tooth-like elements in a row. They are separated by, in particular essentially parallel, indentations adapted to take up wall-like, fixing elements of a container. The protrusions have vertical rim elements on the lateral side of the clamp half.

Provisions maybe made that the upper edge of each protrusion comprises a notch, each notch being aligned in the same direction and in essentially the same height.

In another preferred embodiment the flexible resilient clamp device is characterized in that the fixation structure on at least one clamp half, in particular in the bottom part, comprises an essentially vertical outer wall having at least one essentially circular, holes or groove-like depressions arranged in a pattern adapted to take up pins or protrusions and to be detachably fastened in at least two fixed orientations in a container.

Further, a flexible resilient clamp device is preferred in which the fixation structure on at least one clamp half, in particular in the bottom part, comprises an essentially vertical outer wall having at least one hole or groove-like depression of irregular shape or of regular shape, which is not circular, such as a polygonal shape, adapted to take up pins or protrusions and to be detachably fastened in at least two fixed orientations, such as in a vertical and a horizontal orientation, in a container.

In an another preferred embodiment of a flexible resilient clamp device the fixation structure on at least one clamp half, in particular in the bottom part, comprises an essentially vertical, outer wall having at least one pin, the cross section of which is in particular essentially circular in shape, projecting, in particular horizontally, from the wall. They are arranged in a pattern adapted to be inserted into holes or groove-like depressions and to be detachably fastened in at least two-fixed orientation in a container.

Also preferred is a flexible resilient clamp device in which the fixation structure on at least one clamp half, in particular in the bottom part, comprises an outer wall having at least one pin or stick, the cross section of which is of irregular shape or regular shape, which is not essentially circular. The pin projects horizontally from the vertical wall, and is adapted to be inserted into a hole or a groove-like depression and to be detachably fastened in at least two fixed orientations in a container.

In another aspect, a container system, in particular a container system for the storage of flat items like CDs and/or DVDs, comprises at least two essentially opposite clamp halves which are at least interconnected at the top part of the clamp device, which are adapted to be moved at least in one part towards each other, and which exert an outward pressure when compressed. The clamp further comprises at least in one segment, in particular in the bottom part towards one end of at least one clamp half, at least one fixation structure adapted to hold the clamp in a fixed position and/or on a container by engaging. A container comprises a bottom plate, with two opposing sidewalls being connected to the bottom plate. On each opposing side on and/or adjacent to the bottom plate of the container, at least one fixation structure is provided which is essentially complementary to the fixation structure of the clamp device so that when both complementary fixation structures are engaged, the clamp device is in an essentially fixed position, in particular fixed in all directions.

As a container, also a base plate or bottom plate being essentially void of any side walls can be used as long as the base plate comprises on oppos-

ing sides fixation structure which allows for a clamp which is to be fixated. For example, the base plate can contain sidewalls of a very limited height, which just suffices to provide for the fixation structure for a clamp device. Also, a container can comprise circumferential walls as well as only the above-described opposing walls, leaving part of the container side uncovered. Further, the container can be provided with a lid.

Provisions may be made that complementary fixation structures allow for a fixation of the clamp device in at least two distinct orientations. In vertical orientation the clamp device can function similar to a bookstand, i.e. it can keep flat items like data box carries from falling over. The clamp can also help to furnish different compartments in a container. If only a few data box carriers are left in a respective container or when there is a lot of space left between individual data box carriers or other flat items the clamp device can also be fixed in a horizontal orientation, thereby also stabilizing flat items which are further apart from each other in a container.

In the container systems, the flexible resilient clamp device preferably is fixed in all directions when engaged.

In one preferred embodiment the fixation structure on at least one clamp half, in particular in the bottom part, comprises at least two, three, four or more adjacent protrusions or tooth-like elements in a row being separated by, in particular essentially parallel, indentations adapted to take up wall-like fixing elements of a container. The protrusions have vertical rim elements on the lateral side of the clamp half. These fixation structures can, for example,

interact with a container having complementary fixation structures on opposite sides.

A container is provided which comprises a bottom plate, at least two, in particular longitudinal and/or essentially vertical and/or essentially parallel, side walls on opposing sides, and at least one fixation structure on each opposing side wall, in particular on and/or adjacent to the bottom plate, of the container. They are adapted to engage a clamp device having essentially complementary fixation structures in or on the container in at least one essentially fixed position.

Preferably, with the above clamp device a container is employed which comprises a bottom plate. Two opposing sidewalls are connected to the bottom plate. As a fixation structure, a sequence of essentially vertical, spaced apart fixation elements having essentially the same height and/or length are provided, and which are essentially aligned in parallel to each other in a row, adjacent to each sidewall. Vertical fixation elements on opposing sides are aligned on essentially parallel lines thereby being adapted to hold flat items. At least one strip above each sequence of vertical fixation elements preferably is connected with at least one vertical fixation element and/or with the adjacent side wall, wherein the width of the strip is smaller than the length of the vertical fixation elements, thereby leaving that portion of the vertical fixation elements uncovered which is further apart from the respective adjacent side wall. The vertical fixation elements, i.e. those fixation element parts which are not covered by the strips, form insertion channels or slots which, e.g., can grip and hold data box carriers. The protrusions of the above clamp device are

designed such that the vertical fixation elements of the container fit into the indentations whereby the protrusions fill the space between the vertical fixation elements when the clamp device is inserted in vertical orientation. The height of this protrusion is adjusted to the distance between the bottom plate and the strip so that in the vertical orientation of the clamp at least the front part of the protrusions can slide under the strip.

In a preferred embodiment the upper edge of in particular each protrusion comprises a notch, each notch being in particular aligned in the same direction and in essentially the same height. The use of such a notch provides for an even more uniform fixation of the clamp device as the clamp halves are pressed against the edge of the strip when inserted.

In one aspect, a container system is provided which comprises a container as described above but without any strips, and also a clamp device identical or similar to the one as described above. This clamp device is detachably fixed to the container by adjusting the width of the indentations so that they fit properly with the width of the vertical fixation elements. Such a close fit can also be used with those containers having a strip on opposite sides as described above.

In another embodiment a container comprises a bottom plate. Two opposing, in particular longitudinal and/or essentially vertical, sidewalls are connected to the bottom plate. As a fixation structure, a sequence of pins, the cross section of which is in particular essentially circular in shape, project from the bottom part of each side wall towards each other in the form of at least two rows of pins, aligned above each other, wherein at least two pins are lo-

cated on an essentially vertical line, and wherein the distance between these vertical lines preferably is essentially identical. This container is adapted to take up flat items, in particular in an essentially vertical manner.

With the above container at least one clamp device is proposed to form a container system, the clamp device exhibits a fixation structure on at least one clamp half, in particular in the bottom part, and comprises an essentially vertical outer wall having at least two essentially circular, holes or groove-like depression, arranged in a pattern adapted to take up pins or protrusions, and detachably fastened in at least two fixed orientations in a container. If, for example, two, three, four or more holes are used as a fixation structure on one clamp half which correspond to a complementary arrangement of pins on each side wall of a container, the clamp device can be fixed in, for example, a horizontal as well as in a vertical orientation.

In another embodiment, a container comprises a bottom plate, two opposing, in particular longitudinal and/or essentially vertical, side walls connected to the bottom plate, as a fixation structure a sequence of pins or sticks the cross section of which is of irregular shape or regular shape, which is not essentially circular, and projecting from a bottom part of each side wall towards each other in the form of at least one row of pins. Opposing pins on opposing side walls are in particular located on essentially parallel lines, and wherein the distance between these lines preferably is essentially identical. Thus, another preferred embodiment of a container system makes use of pins or protrusions, the cross-section of which does not have the form of a circle but has an irregular or regular form, in particular a polygonal form, i.e. the

shape of a triangle, square, rectangle, pentagon or hexagon, to mention a few. With such a pin shape only one pin already suffices to interact with a clamp device having a corresponding fixation structure, i.e. a hole in the shape of a triangle, square, rectangle, etc., on at least one of both or several clamp halves in order to be able to fixate the clamp device in different orientations within the container, preferably in a horizontal and vertical orientation. Therefore, in a preferred container system with the above container at least one clamp device is employed having a fixation structure on at least one clamp half, in particular in the bottom part, which comprises an essentially vertical outer wall having at least one hole or grove-like depression of irregular or of regular shape, which is not circular, in particular of a polygonal shape, adapted to take up pins or protrusions and to be detachably fastened in at least two fixed orientations in a container.

In another embodiment a container comprises a bottom plate, two opposing, in particular longitudinal and/or essentially vertical, side walls connected to the bottom plate, as a fixation structure a sequence of holes or groove-like depressions in each opposing side wall, the cross-section of which is in particular essentially circular in shape, in particular aligned adjacent to the bottom part of each side wall and/or within essentially identical distance to the bottom plate. Opposing holes or depressions on opposing side walls are at least located in particular on essentially parallel lines, and wherein the distance between these parallel lines preferably is essentially identical. Also, these container systems allow for a horizontal and vertical orientation of a clamp device.

With the above container at least one clamp device is proposed to form a container system, the clamp device having the fixation structure on at least one clamp half, in particular in the bottom part. It comprises an essentially vertical, outer wall having at least two pins, the cross section of which is in particular essentially circular in shape, projecting, in particular horizontally, from the wall arranged in a pattern adapted to be inserted into holes or groove-like depressions and to be detachably fastened in at least two fixed orientations in a container.

In another embodiment, a container comprises a bottom plate, two opposing longitudinal and/or essentially vertical, side walls connected to the bottom plate, as a fixation structure a sequence of holes or groove-like depressions in each opposing side wall, the cross-section of which is of irregular shape or regular shape, which is not essentially circular, in particular of polygonal shape, and aligned adjacent to the bottom part of each side wall and/or within essentially identical distance to the bottom plate. Opposing holes or depressions on opposing side walls are at least located on essentially parallel lines, and wherein the distance between these parallel lines preferably is essentially identical.

With the above container at least one clamp device is proposed to form a container system, the clamp device having a fixation structure on at least one clamp half, in particular in the bottom part, which comprises an essentially vertical, outer wall having at least one pin or stick, the cross-section of which is of irregular or regular shape which is not essentially circular, in particular of a polygonal shape. The pin projects horizontally from the vertical wall, and is

adapted to be inserted into a hole or a groove-like depression, and is detachably fastened in at least two fixed orientations in a container.

Other embodiments of a container and container systems are characterized in that the fixation structure elements are located not only adjacent to the bottom part of the side walls of the container, but are also located in the intermediate and/or top part of the side walls, so that there can be several rows of fixation structure elements on opposing container walls on different levels.

In another embodiment the fixation structure elements are located in the intermediate part and/or the top part of the sidewalls, but not at the bottom part of the sidewalls or adjacent to the bottom plate of the container. By also providing fixation structure elements at a greater distance from the bottom plate of the container it has been found that clamp devices which are inserted in a horizontal orientation are well suited to keep flat items in the container from falling over.

Of course, opposing clamp halves can not only be provided with the same fixation structure but also with different types of fixation structures as described above. The same applies for corresponding fixation structures on opposing container walls. Even fixation structure on different levels on the same container wall can vary.

The container system can be used, for example, as a toolbox, a medicine box, a cosmetic box, a media box, in particular a book, CD- and/or DVD-box, or a garden box.

With the container system, there is the unexpected realization of the possibility to provide a clamp device, which is adapted to be detachably fixed in at least two different directions, in particular in a horizontal and a vertical direction. In both directions the clamp serves as a fixedly fastened support structure for, e.g., vertically placed items, in particular flat box-like structures. Further, container systems are obtained with the present invention with which, for example, flat items can be easily and safely stored and also transported.

Figs. 1a to 1e depict various modifications of an arc-like clamp device 1. Clamp device 1 exhibits two symmetrical axes, and is made from a flexible resilient material such as a thermoplastic polymer or an impact modified thermoplastic polymer. It comprises in general a top, intermediate and bottom part 4, 6 and 8, respectively. Top part 4 connects opposite clamp halves 10 and 12, which can be squeezed towards each other (as indicated by the arrows). Usually, intermediate part 6 is most suited to be used to squeeze both clamp halves 10 and 12 towards each other. The clamp according to Figs. 1a to 1e also comprises two opposite longitudinal rims 14 and 16 adjacent to the side edges of upper wall element 2. These side rims 14, 16 also provide additional flexible strength to the resilient clamp device 1. The clamp device 1 not only comprises longitudinal rims 14, 16, but also rims elements 18, 20, 22 and 24 on both lateral sides of clamp device 1. These rim elements are part of adjacent tooth-like elements or protrusions 26, 28, 30 and 32 separated by essentially parallel indentations 34, 36 and 38, which together form fixation structure 3. The indentations are designed such that they can take up essentially parallel fixing elements of, for example, a container or a base plate. The upper

edge of each tooth-like element 26, 28, 30 and 32 can comprise a notch 40, which is suited to be placed against corresponding fixing structures, e.g. a protrusion or the edge of the strip, in a container. The clamp device according to Fig. 1a is suited to be placed and detachably fixed in a container in an upright or vertical position, as depicted, as well as, when turned on one of its two side faces 42 and 44, into a horizontal orientation.

Figs. 1b, 1c and 1d show clamp devices 1, which comprise in addition to clamp device 1 of Fig. 1, at least one additional functional element. Clamp device 1 as in Fig. 1b exhibits two holes 46 and 48 in at least one of its longitudinal rims 14' and/or 16' which can serve as a holder, e.g., for pens, pencils or other tools when fixed in a horizontal position. Alternatively or in addition to these holes one or more holes 50 can also be placed in the upper wall element 2 of clamp device 1, so that pens or pencils or the like can also be stored when clamp device 1 is vertically fixed, as shown in Fig. 1c.

In another embodiment the top part 4 of clamp device 1 contains a trench or slot 54, the depth of which can be varied. If, for example, the clamp device 1 is used as a fixation structure in a CD-box, such a slot 54 is well suited to at least temporarily take up a CD box carrier, which facilitates the handling of CDs to a great extent, for example when changing individual CDs.

According to Fig. 1e the space 52 within the arc-like structure of clamp device 1 can be filled with a flexible material such as a rubber-like or foam material.

In Fig. 2 a clamp device 1' is shown similar to the one in Fig. 1 but without a notch at the lateral edges 18, 20, 22 and 24 at the bottom part 8 of the clamp device 1'.

Clamp devices as depicted in Figs. 1a to 1e and 2 can be fixedly placed, horizontally as well as vertically, in a container or box 56 as shown in Fig. 3 forming a container system 57. Container 56 is equipped with a multitude of vertical fixation elements 58, 60 which are aligned parallel to each other adjacent to the bottom part 70 of the container 56 inside the longitudinal walls 62, 64 of the container. The fixation elements 58 and 60, which face each other on opposite sides, extend towards each other only to a certain extent still leaving enough space for a clamp device to be placed in between. Further, the container according to Fig. 3 comprises above the vertical fixation elements 58 and 60 horizontal strips 66, 68 that are essentially aligned in parallel to the bottom part 70 of container 56. These strips 66 and 68 can be placed directly on top of the fixation elements 58 and 60, respectively, and/or can be fixed to the longitudinal walls 62 and 64 of the container 56. The width of the strips 66 and 68 does not surpass the length of the vertical fixation elements 58 and 60. Those parts of the vertical fixation elements 58, 60 which are not covered by strips 66, 68 can be used to receive or grip, for example, a compact disc carrier box. As long as there are still slots 71 left without a CD-box, clamp devices 1 and 1' can be fixedly placed in these non-occupied slots 71, preferably adjacent to the terminal CD-box in order to prevent the CD-boxes in the container 56 from falling over. Also, with the aid of clamp devices 1, 1', container 56 can easily be subdivided into sections. The fixation ele-

ments 58, 60 and strips 66 and 68 form a fixation structure 300 at each opposing sidewall 62, 64.

In Fig. 4 another container 56' is shown. Instead of wall-like vertical fixation elements several sticks 72, 74 as the fixation structure are projecting inside the container 56'. In the present embodiment, sticks 72, 74 are located on the longitudinal walls 62' and 64' in two rows which are both essentially parallel to the bottom edge of the longitudinal wall 62', 64'. Thus, there are two sticks 72, 74 above each other in a vertical line. Similar to the horizontal fixation elements 58, 60 in Fig. 2, adjacent pairs of sticks 72, 74 may serve as a fixation structure to receive or grip a CD-box. Again, in order to prevent these CD-boxes from falling over as long as not all slots 71 of container 56' are completely filled, a clamp device 1" as shown in Figs. 5a, 5b and 5c can be employed, either in a horizontally or in a vertically fixed position. Clamp devices 1" according to Figs. 5a and 5b essentially resemble clamp device 1 according to Figs. 1a to 1e with respect to their top and intermediate parts 4 and 6, respectively. The bottom parts 80 comprise a vertical wall element 82 with either one pair or two pairs of holes 84, each located on a vertical line.

From Fig. 6 the way a clamp device according to the invention can be placed inside a container can be derived.

Fig. 7 shows a clamp device 1''' in a container 56 in a sectional view from the lateral side of a container 56. The clamp device 1''' is in its horizontal orientation. In Fig. 8 the arrangement of Fig. 7 is shown from above. Clamp device 1''' is fixed in a horizontal orientation. The clamp force is such that the opposite bottom parts would be further apart if not constrained within the con-

tainer 56. The outer tooth-like element or protrusion 26' lies above the plane of strips 66, 68, and all other tooth-like elements are beneath the strip.

Different from Fig. 7, in Fig. 9 clamp device 1''' is in a vertical orientation. The tooth-like elements or protrusions are beneath strips 66, 68, thereby engaging the fixation structures formed of fixation elements 58, 60 adjacent to both longitudinal sidewalls of the container. Fig. 10 is a top view of the arrangement of Fig. 9, showing the mode of action of the clamp 1'''.

Fig. 11 depicts a sectional side view from the lateral side of the container, the arrangement comprising a clamp device as shown in Fig. 1a. The design of clamp device 1 according to Fig. 11 secures a very tight and reliable fixation, especially in its horizontal orientation, when notch 40 takes up the edge of the strips 66, 68.

In Fig. 12a another embodiment of the clamp device 1'''' is shown which comprises at the bottom part of its opposite clamp halves 10, 12 a vertical wall element with at least two sticks or pins 86. Figs. 12b and 12c depict two variants of the cmp structure 1'''' of Fig. 12 when turned around its vertical axis for about 90°. Sticks 86 are either arranged as a pair of sticks on a vertical line or as two pairs of sticks each arranged on a separate vertical line. A clamp device 1'''' according to this embodiment can be used as a fixture in a box 56'', the longitudinal side walls of which comprise, for example, two rows of holes 184 which correspond in distance to the pins of clamp device 1'''', as shown in Fig. 13. Also, this arrangement allows for clamp device 1'''' to be fixedly arranged in a horizontal and in a vertical position. From Fig. 13, also a second row of fixation elements, i.e. holes 184 in the present embodiment, in

the intermediate part of the side wall can be derived, allowing for clamp devices 1"" to be located/fixed at a greater distance from the bottom plate of the container, in particular in a horizontal orientation when flat items are to be kept from falling over. A vertical placement in these upper fixation elements is preferred if the clamp device should serve as a handle.

Fig. 14 represents a side view of another embodiment of a clamp device 1"". Again, the clamp device has an arc-like structure, which resembles in its top and intermediate parts 4 and 6 those clamp devices as described above. Also, the clamp arms are provided in their bottom parts 88 with a vertical wall element 90. These wall elements comprise a stick 92 which projects from the surface of these wall elements 90, having a square-like or rectangular cross section, as can be seen from Fig. 15. As with the clamp of Fig. 1d clamp device 1"" can also be provided with a slot 54. Clamp devices 1"" are well suited to be pressed into boxes 56"' the longitudinal side walls 62', 64' of which each comprise a row of holes 94 adjacent to the bottom part of the longitudinal side walls 62', 64' having a shape which corresponds to the cross section of sticks 92. These holes 94 are preferably arranged in such a way that clamp device 1"" can be fixedly placed in box 56"' in a horizontal as well as in a vertical orientation, as shown in Fig. 16. Also, the fixation structures of the container 56"' can be arranged at, for example, two different levels at the sidewalls 62', 64'. In Fig. 17 a box 56"' can be seen in which clamp device 1"" has been placed in a vertical orientation. Stick 92 can also have any other cross-section as long as this allows clamp device 1"" to be placed in a fixed orientation, especially in a horizontal and/or vertical orientation. Suitable cross

sections also comprise polygonal forms different from a square or a rectangle, such as a triangle, or a pentagonal or a hexagonal form.

While a preferred embodiment has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character, it being understood that only the preferred embodiment has been shown and described and that all changes and modifications that come within the spirit of the invention both now or in the future are desired to be protected